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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,231	02/03/2006	Roel Penterman	NL030981	9449
24737 7590 02/05/2009 PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510				
EXAMINER				
HON, SOW FUN				
ART UNIT		PAPER NUMBER		
1794				
MAIL DATE		DELIVERY MODE		
02/05/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/567,231

Applicant(s)

PENTERMAN ET AL.

Examiner

SOPHIE HON

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-13 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CDC)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/17/08 has been entered.

Response to Amendment

Withdrawn Rejections

2. The 35 U.S.C. 103(a) rejections of claims 1-13 are withdrawn due to Applicant's amendment dated 10/17/08.

New Rejections

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

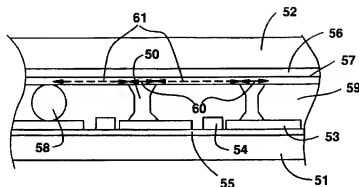
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 11-13 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Shimizu (US 5,739,882).

Regarding claim 11, Shimizu teaches a method of manufacturing a polymeric stratified-phase-separated composite (resin 50 separated from liquid crystal material 59, column 12, lines 38-40) in Fig. 5 shown on the next page, comprising a film of a liquid (liquid crystal 59, column 12, lines 28-38) and supporting members formed of a polymerized material and extending through the film of liquid (polymerized column spacer 50, column 12, lines 35-40), the polymeric stratified-phase-separated composite being provided, with its film of liquid side, on a substrate surface having in accordance with a pre-determined pattern selected first and second regions, the first regions being functionalized for selective accumulation of the polymerized material (precipitated on the substrate at portions 60 which are intentionally rendered hydrophobic, column 13, lines 10-15) and the second regions being functionalized for selective accumulation of the liquid (hydrophilic 61 portions to be in contact with the liquid crystal, column 13, lines 35-40), wherein the supporting members 50 extend selectively and self-align onto the selected first regions 60, for the purpose of providing the desired control of the positioning of the supporting members (conclusively, positions precipitating the resin can be controlled as desired, column 13, lines 8-16).

FIG.5



Shimizu teaches the steps of providing a substrate surface having in accordance with a pre-determined pattern selected first and second regions, the first regions being functionalized for selective accumulation of the polymerized material (precipitated on the substrate at portions 60 which are intentionally rendered hydrophobic, column 13, lines 10-15) and the second regions being functionalized for selective accumulation of the liquid (hydrophilic 61 portions to be in contact with the liquid crystal, column 13, lines 35-40); providing onto the substrate surface, a layer of polymerizable stratified-phase-separable material (surface of the substrate to be in contact with the liquid crystal mixture, column 13, lines 35-40); and obtaining the polymeric stratified-phase-separated material composite from the polymerizable stratified-phase-separable material by inducing polymerization of the polymerizable stratified-phase-separable material at least at locations where the layer of polymerizable stratified-phase-separable material is adjacent to the first regions (the polymer resin in the cell is cured thereafter by irradiating UV radiation, column 15, lines 39-42).

Although Shimizu fails to teach the layer of polymerized material covering the film of liquid in the final product of the one embodiment described above, the combination of method steps taught by Shimizu, as described above, does not preclude the formation of that feature which is recited as part of the intended purpose of the presently claimed method steps of manufacturing, and is capable of inherently supporting an intended step of providing a layer of a polymerized material covering the film of liquid, for the purpose of further increasing the adhesion strength between the two substrates, that is provided by the supporting members as taught by Shimizu (cured resin columns, column 12, lines 60-65).

Regarding claim 12, Shimizu teaches that the polymerizable stratified-phase-separable material is photo-polymerizable (column 15, lines 39-42).

Regarding claim 13, Shimizu teaches that the photo-polymerization is induced by means of irradiation of the entire cell (column 15, lines 39-42) which is a form of flood exposure.

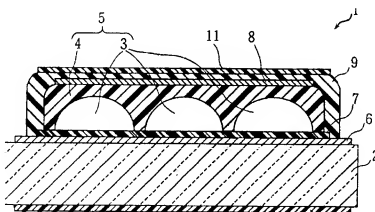
Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 1-2, 4, 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao (US 6,486,932) in view of Shimizu (US 5,739,882).

Regarding claim 1, Nakao teaches a polymeric stratified-phase-separated composite (5, column 8, lines 62-66, Fig. 1) shown on the next page, comprising a film

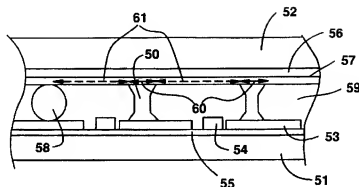
of a liquid (liquid crystal 3, column 8, lines 64-66, Fig. 1) as defined in Applicant's specification (liquid crystal, page 6, lines 5-25), a layer of polymerized material (polymer resin 4, column 8, lines 64-66, Fig. 1) covering the film of liquid 3, and supporting members formed of the polymerized material and extending from the layer of polymerized material 4 through the film of liquid 3 (hatched area 4, Fig. 1), the polymeric stratified-phase-separated composite 5 being provided, with its film of liquid 3 side, on a substrate surface (2, column 8, lines 62-67, Fig. 1) having in accordance with a predetermined pattern selected first and second regions, the first regions being treated for selective accumulation of the polymerized material 4 and the second regions being treated for selective accumulation of the liquid 3 (treating a surface of a substrate to control a wettability such that a wettability of the substrate by a liquid crystal is larger than a wettability of the substrate by a prepolymer component, column 6, lines 1-5), wherein the supporting members extend selectively onto the selected first regions (hatched area 4, Fig. 1).



Applicant's specification identifies Nakao (U.S. Pat. 6,486,932, page 5, lines 13-16) as having a structure that meets the presently claimed structure. Nakao fails to specify that the first regions and second regions are functionalized such that the supporting members not only extend selectively but also self-align onto the selected first regions.

However, Shimizu teaches a polymeric stratified-phase-separated composite (resin 50 separated from liquid crystal material 59, column 12, lines 38-40) in Fig. 5 shown on the next page, comprising a film of a liquid (liquid crystal 59, column 12, lines 28-38) and supporting members formed of a polymerized material and extending through the film of liquid (polymerized column spacer 50, column 12, lines 35-40), the polymeric stratified-phase-separated composite being provided, with its film of liquid side, on a substrate surface having in accordance with a pre-determined pattern selected first and second regions, the first regions being functionalized for selective accumulation of the polymerized material (precipitated on the substrate at portions 60 which are intentionally rendered hydrophobic, column 13, lines 10-15) and the second regions being functionalized for selective accumulation of the liquid (hydrophilic 61 portions to be in contact with the liquid crystal, column 13, lines 35-40), wherein the supporting members 50 extend selectively and self-align onto the selected first regions 60, for the purpose of providing the desired control of the positioning of the supporting members (conclusively, positions precipitating the resin can be controlled as desired, column 13, lines 8-16).

FIG.5

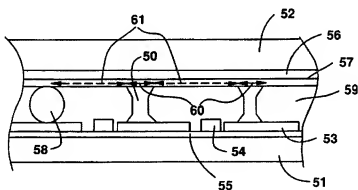


Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have functionalized the first regions and second regions such that the supporting members not only extend selectively but also self-align onto the selected first regions in the polymeric stratified-phase-separated composite of Nakao, in order to obtain the desired control of the positioning of the supporting members, as taught by Shimizu.

Regarding claim 2, Nakao teaches that the first regions are treated for selective accumulation of the polymerized material 4 and the second regions are treated for selective accumulation of the liquid 3 (treating a surface of a substrate to control a wettability such that a wettability of the substrate by a liquid crystal is larger than a wettability of the substrate by a prepolymer component, column 6, lines 1-5). Thus the selected first and second regions are regions of high and low affinity, respectively, for polymerizable material from which the polymerized material of the supporting members is obtained.

Regarding claim 4, Shimizu teaches that the first regions are functionalized for selective accumulation of the polymerized material (precipitated on the substrate at portions 60 which are intentionally rendered hydrophobic, column 13, lines 10-15) which means that they are functionalized for facilitating a relatively high rate of polymerization, and that the second regions are functionalized for selective accumulation of the liquid (hydrophilic 61 portions to be in contact with the liquid crystal, column 13, lines 35-40) which means that they are functionalized for facilitating a relatively low rate of polymerization, for the purpose of providing the desired control of the positioning of the supporting members (conclusively, positions precipitating the resin can be controlled as desired, column 13, lines 8-16).

FIG.5



Regarding claim 6, Nakao teaches that the polymeric stratified-phase-separated composite can be a photo-polymeric stratified-phase-separated composite (column 6, lines 15-20).

Regarding claim 7, Nakao teaches that the supporting members are formed as walls partitioning the film of liquid into a plurality of separate liquid-filled pockets (liquid crystal 3, hatched area 4, column 8, lines 64-66, Fig. 1).

Regarding claim 8, Nakao teaches that the liquid is a liquid crystal (liquid crystal 3, column 8, lines 64-66, Fig. 1).

Regarding claim 9, Nakao teaches that the substrate surface 2 is, on a side facing the film of liquid 3, provided with an alignment layer 7 (column 9, lines 5-10, Fig. 1).

Regarding claim 10, Nakao teaches a liquid crystal display comprising the polymeric stratified-phase-separated composite 5 (column 8, lines 54-65).

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao in view of Shimizu as applied to claims 1-2, 4, 6-10 above, and further in view of Wu (US 6,322,861).

Nakao, as modified by Shimizu, teaches the polymeric stratified-phase-separated composite comprising supporting members and substrate surface having in accordance with a predetermined pattern selected first and second regions, the first region being a region of high affinity for polymerizable material from the which the polymerized material of the supporting members is obtained, being functionalized for selective accumulation of the polymerized material and the second region being a region of low affinity for polymerizable material from the which the polymerized material of the supporting members is obtained, being functionalized for selective accumulation of the liquid, as discussed above. In addition, Shimizu teaches that the regions of high affinity on the

substrate surface are functionalized with coupling agents which contain chemically reactive groups (precipitation positions of the polymerized spacer can be defined by providing hydrophobic 60 portions on the surface of the substrate by applying a coupling agent, column 13, lines 37-42, Fig. 5), for the purpose of providing the desired control of the positioning of the supporting members (conclusively, positions precipitating the resin can be controlled as desired, column 13, lines 8-16). Thus the regions of low affinity are not so functionalized. Shimizu fails to disclose that regions of the supporting members are also functionalized with chemically reactive groups to react and form covalent bonds with the chemically reactive groups of the substrate surface.

However, by virtue of their function, coupling agents inherently contain multiple chemically reactive groups that couple two components, each containing at least one chemically reactive group, together to form covalent bonds for the purpose of providing the desired bond strength. Thus the use of a coupling agent suggests to one of ordinary skill in the art that regions of the supporting members can also be functionalized with chemically reactive groups, as evidenced by Wu.

Wu teaches that coupling agents couple two components together through chemically reactive groups (reactive coupling is a process of creating a chemical bond between two components (column 5, lines 24-30) present on each component (reactive groups within the coatings on the substrate, reactive groups within the spacer particle, column 5, lines 35-45).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have further functionalized regions of the supporting

members in the polymeric stratified-phase-separate composite of Shimizu, with chemically reactive groups, to couple and hence react to form covalent bonds with the chemically reactive groups of the substrate surface, as evidenced by Wu, in order to obtain the desired bond strength.

Allowable Subject Matter

6. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest cited prior art of record, US 6,486,932, fails to fairly teach or suggest, even in view of US 5,739,882 and US 6,322,861, a polymeric stratified-phase-separated composite comprising a film of a liquid, a layer of a polymerized material covering the film of liquid and supporting members formed of the polymerized material and extending from the layer of polymerized material through the film of liquid, the polymeric stratified-phase-separated composite being provided, with its film of liquid side, on a substrate surface having in accordance with a predetermined pattern selected first and second regions, the first regions being functionalized for a high rate of polymerization facilitated by means of a low concentration of a polymerization inhibitor for selective accumulation of the polymerized material and the second regions being functionalized for a low rate of polymerization by means of a high concentration of a polymerization inhibitor for selective accumulation of the liquid, wherein the supporting members extend selectively and self-aligned onto the selected first regions.

None of the references teach the presence of a polymerization inhibitor, let alone low or high concentrations, in either the first or second regions of the substrate surface.

Response to Arguments

7. Applicant's arguments regarding claims 1-4, 6-10 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication should be directed to Sow-Fun Hon whose telephone number (571)272-1492. The examiner can normally be reached Monday to Friday from 10:00 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks, can be reached on (571)272-1401. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sophie Hon

Sow-Fun Hon

Examiner, Art Unit 1794